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# *Indian Standard*

# GENERAL REQUIREMENTS FOR TINTED OPHTHALMIC GLASS

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**BUREAU OF INDIAN STANDARDS**
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

**Gr 2** *May* 1972

# AMENDMENT NO. 1 JUNE 1975
# TO
# IS:6472-1971 GENERAL REQUIREMENTS FOR TINTED OPHTHALMIC GLASS

## Addendum

*(Page 5, clause 4.6)* - Substitute the following for the existing clause:

> 4.6 'The tinted ophthalmic glass shall be well annealed such that the residual strain is minimum and symmetrically distributed. The retardation due to birefringence in blanks caused by strain shall not exceed 50 nm/cm for glass diameter up to 60 mm of single vision ware and 80 nm/cm for larger size piece of glass.'

(EDC 36)

Reprography Unit, BIS, New Delhi, India

# *Indian Standard*

# GENERAL REQUIREMENTS FOR TINTED OPHTHALMIC GLASS

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# *Indian Standard*

# GENERAL REQUIREMENTS FOR TINTED OPHTHALMIC GLASS

## 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 29 November 1971, after the draft finalized by the Optical and Mathematical Instruments Sectional Committee had been approved by the Mechanical Engineering Division Council.

**0.2** This standard deals with the requirements of tinted ophthalmic glass used for making sunglasses and tinted lenses. The requirements of non tinted ophthalmic glass are covered in IS:4382-1967*.

**0.3** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS:2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

## 1. SCOPE

**1.1** This standard specifies requirements of tinted ophthalmic glass used for making sunglasses and tinted lenses.

## 2. TERMINOLOGY

**2.0** For the purpose of this standard the following definition in addition to those given in IS:1382-1961‡, IS:1399-1959§, and IS:4382-1967* shall apply.

**2.1 Tinted Ophthalmic Glass** — A range of ophthalmic glasses having low transmission in near ultra-violet and near infra-red region.

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*Specification for non-tinted ophthalmic glass.
†Rules for rounding off numerical values ( *revised* ).
‡Glossary of terms relating to glass industry.
§Glossary of terms used in optical technology.

## 3. TYPES

**3.1** Tinted ophthalmic glass blanks shall be available in the following forms:

a) Blown ophthalmic blanks,

b) Rolled sheet glass blanks, and

c) Moulded glass blanks.

## 4. MATERIAL

**4.1** Tinted ophthalmic glass shall be reasonably in the same condition throughout and it shall be homogeneous in composition or optical properties.

**4.2** Ophthalmic glass shall be free from all impurities and deposits of undissolved or crystalized materials. These shall be tested by the method specified in **6.1**.

**4.3** The material shall be free from defects, such as bubbles, striae, veins seeds and other internal irregularities which may be observed by inspection by normal eye under conditions of adequate illuminations against a suitable background.

**4.4** The moulded blanks shall be free from felps and folds introduced during moulding operations.

### 4.5 Absorption and Transmission

**4.5.1** The tinted glass material shall not depart significantly in transmission characteristics from the manufacturers or suppliers published figures for the particular material. The following characteristics of the material shall be contained in the published data:

a) Transmission curve for a specimen 2 mm thick over the range 300 to 1 000 nm and

b) The integrated visible factor for C.I.E. standard illuminant 'A' at 2 mm and at least one other stated thickness of material.

**4.5.2** The spectrum region shall be divided into three different classes, namely, the near ultra-violet region ( 310 to 400 nm ), the visible region ( 400 to 700 nm ) and the near infra-red region ( 700 to 1 000 nm ). The percentage transmission shall be measured in all regions by any standard method.

**4.5.3** An ophthalmic tinted glass blank should show a marked diminution in the transmission curve below 300 nm for ultra-violet rays as well as above 1 000 nm for the infra-red rays. The maximum integrated transmission for the ultra-violet region and infra-red region shall be 5 percent and 50 percent respectively; while that in the visible spectral region it shall be as required by the indentor.

**4.6** The ophthalmic tinted glass shall be well annealed such that the residual strain is minimum and symmetrically distributed. The retardation due to birefringence in blanks caused by strain shall not exceed 40 nm/cm.

**4.7** When measured with a standard refractrometer, the refractive index for the spectrum *D* line of the crown glass shall be allowed to vary between 1·520 to 1·523, but this index value for a particular batch shall be correct within ± 0·001 and this should be rigidly controlled.

**4.8** Tinted ophthalmic glass shall be durable and shall correspond to Type 4 of IS : 2303-1963*.

## 5. SPECIAL REQUIREMENTS

**5.1** The type of ophthalmic tinted glass used in moulding of blanks shall be clearly stated in the contract.

**5.2** The dimensions of the moulded blanks shall conform to the specification of the contract. When dimensions of the finished lens have been specified in the contract, sufficient margin for grinding the lens shall be provided for grinding operations.

## 6. TESTS

**6.1** Every blank, sheet, etc, of tinted ophthalmic glass shall be tested for the presence of striae, bubble, seeds, stones, etc, by any of the methods given in Appendix A of IS : 1400-1960†.

## 7. MARKING

**7.1** Each envelop containing a pair of blanks from the same melt shall be indicated with the melt number, type, number, grade, size of the blank and base curve.

**7.1.1** Spherical surfaces shall be kept free of raised marking, as far as practicable, to permit use of gauges.

**7.1.2 The product may also be marked with Standard mark.**

**7.1.3 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.**

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*Method of grading glass for alkalinity.

†Specification for optical glass.

## 8. PACKING AND PACKAGING

**8.1** A pair of blanks from the same melt shall be placed in a small double envelop which shall be packed in cardboard boxes, each containing 10 pairs of blanks. The cardboard boxes shall then be packed in wooden or plywood cases with adequate packing material to withstand transport mishandling in accordance with normal commercial practices. The weight of the wooden or plywood case shall not exceed 50 kg.

**8.2** Each cardboad box shall be marked with the following:

a) Grade of glass,
b) Refractive index,
c) Shade of glass,
d) Size of the blank,
e) Quantity of the material, and
f) Name of the manufacturer.

**8.3** Information regarding the material, type, size and quantity of tinted ophthalmic glass blanks and the name of the manufacturer shall be marked on the wooden or plywood case with appropriate marking for all fragile material according to IS: 1286-1967*, together with the legend, 'GLASS, HANDLE WITH CARE' in red.

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*Pictorial markings for handling of goods in general (*first revision*).

( *Continued from page* 2 )

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